Colorado School of Mines

Founded in 1874

A public, state supported university of science and engineering

6000 total students
  4600 undergraduates
  1400 graduate students

15:1 student to faculty ratio
Chemical Engineering PhD Program

Chemical Engineering Core

Advanced Thermodynamics (CHEN509)

Transport Phenomena (CHEN516)

Advanced Kinetics (CHEN518)

Introduction to Chemical Engineering Research and Teaching (CHEN568)

Additional Curriculum

6 hours (2 courses) chemical engineering electives

12 hours (4 courses) additional electives

CBEN colloquium every semester

Thesis research credits

Minimum of 72 credit hours total
Chemical Engineering Graduate Program Statistics

Degrees Offered
Chemical Engineering – M.S. & Ph.D.

Fall 2015 Enrollment
- Ph.D. 69
- Master’s 10
- Minority 5%
- Female 25%
- International 50%

Admissions Statistics:
- Average accepted GRE Quantitative 84%
- Average accepted GRE Verbal 69%
- Average accepted GPA 3.78
- % applicants accepted 26.9%
Approximately $7 million in annual research awards.

Research area include bioengineering, conventional energy conversion, hydrates, renewable energy, simulation and modeling, soft materials, and electronic materials.

Strong collaboration and research opportunities with National Renewable Energy Laboratory, Children's Hospital Colorado.
Bioengineering (Boyle, Cash, Krebs, Marr, Neeves)

- Human trabecular meshwork cells seeded on collagen scaffolds
- Microfluidic model of vascular injury
- Biosensors
- Diagnostics
- Drug delivery
- Metabolic engineering
- Microfluidics
- Tissue engineering
- Nanosensors for in vivo monitoring of metabolites
- Metabolic engineering of photosynthetic organisms
Colloids, Polymers, and Complex Fluids
(Dorgan, Marr, Neeves, D. Wu, N. Wu)

Magnetically actuated colloid pump and valves

Bionanocomposites-carbon nanoparticles and polylactide

Bioplastics
Polymer composites
Self assembly
Viscoelastic fluids
Polymer dynamics
Cardiovascular fluid mechanics

Colloidal molecules assembled by electric fields
Computational Science
(Dean, Dorgan, Maupin, Sum, D. Wu)

Golden Energy Computing Organization
CSM/NREL/NCAR
Targeting energy research
>20 teraflops

Clathrate Hydrates
Biomembranes

Cel7B (Endo-Cellulase) on a cellulose micro fibril
Fuel cells (Dean, Herring, Maupin, Way)

Solid oxide fuel cells
Proton exchange membrane fuel cells
Kinetics and transport in fuel cells

Design and simulation of proton exchange membranes

Colorado School of Mines
Hydrates (Koh, Sum, D. Wu)

- Hydrates in Flow Assurance
- Hydrates in Science
- Hydrates in Nature

Hydrates in flow assurance
Hydrates in science
Hydrates in nature
Membranes and Catalysis (Carreon, Gardner, Maupin, Way)

Nano-structured supports
Catalytic membrane reactors
Zeolite membranes
Hydrogen purification
**Solar and Electronic Materials**

(Agarwal, Wolden, N. Wu)

**Plasma synthesis of silicon nanocrystals**

1. **I. Precursor injection**
2. **II. Dissociation**
3. **III. Polymerization**
4. **IV. Nucleation**

**CuSbS₂ solar absorber**

Thin film synthesis
Plasma processing
Colloidal synthesis

Atomic layer deposition

**CRSP**
Center for Revolutionary Solar Photoconversion
Third Generation Solar Photon Conversion

**Internal Reflection Element for In Situ IR Spectroscopy**

**Atomic layer deposition**
Benefits

PhD graduate research fellowship
- Annual stipend $26,000
- Fully paid tuition, fees, health insurance
- Total value: >$50,000/year
Location, Location, Location

15 miles from downtown Denver...

...minutes from world class outdoor recreation
Application

- Fall Application Deadline – December 15th for priority consideration for financial support
  (no Spring enrollment)
- Apply online at http://www.mines.edu/gradschoolapp/onlineapp.html
- Application Requirements
  - Undergraduate transcript
  - Graduate Record Exam (GRE) (revised General test)
  - 3 letters of recommendation
  - Statement of purpose
Questions? Contact

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